Oenanthe oenanthe Wheatear

None seen in the western Mediterranean, but frequently in the eastern Mediterranean after Malta. One spent the night in the bar. None in the Canal nor after that.

Calandrella brachydactyla

Short-toed Larks were seen 24 hours out of Bombay. We first saw them sitting high on the cross-trees of the mast, 3 together. During the day more were seen. They came down on to the decks and drank water put down for them by passengers. They were very tame. I never saw any leave the ship and when we sailed into Bombay on 4 October, there were still numbers on board. I could not tell to which race they belonged. The short hind claw was clearly visible. It is interesting to see what considerable migration takes place out at sea when one would think it much easier for birds to follow the coast line.

British Embassy,
Kathmandu, DESIRÉE PROUD
Nepal,
March 21, 1961.

12. THE EGGS AND FLIGHT OF THE GECKO *PTYCHOZOON KUHLI* STEJNEGER FROM CAR NICOBAR

(*With one text-figure*)

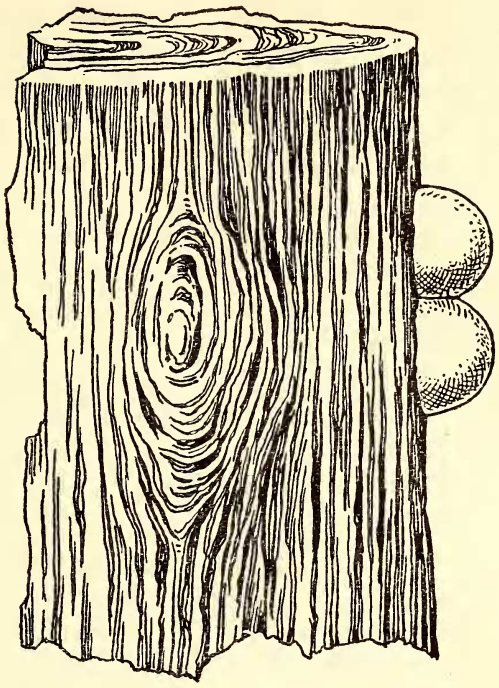
The eggs of *Ptychozoon kuhli* Stejneger are unusual in two features: they are hemispherical in shape with a flat, circular 'base', and they are often laid (at least under natural conditions) on surfaces vertical to, and above, the ground. I have seen a few pairs of such eggs laid on bark of trees about 1½ to 2 ft. (45 to 60 cm.) above ground in Car Nicobar Island. These eggs, which are easily mistaken for mushrooms and thus overlooked, are firmly attached to the bark by a thick layer of a coarse cementing substance which often overflows the boundaries of the 'base' of egg. In a pair of eggs collected by me from the bark of a tree at Passa Bridge in Car Nicobar on 23 March 1959, the diameter of base measured 15 mm., while the maximum height was 11 mm. The shell was dirty white in colour, and when broken open, one of the eggs yielded an almost full-grown embryo of *Ptychozoon.*

Tweedie (1954) has given an excellent photograph of a pair of eggs of *Ptychozoon kuhli* collected from the bark of a tree in Malaya. Those observed by me in Car Nicobar (see Text-fig.) were similar to Tweedie's photograph.

Cantor (1847), who was the first to record the eggs of *Ptychozoon*, refers to a female that deposited a *single egg of a spherical form*, about half an inch in diameter, soft and of a yellowish white colour. Bauer (1885), reporting later, mentioned a captive female of this species from Java that laid a pair of eggs in the box in which she was kept. He says nothing about the shape of the eggs but records the long incubation period of the eggs which, laid in November, did not hatch out until the middle of the following May. Annandale (1904) refers to the eggs of *P. homalocephalum*, which are laid two at a time and which 'adhere to leaves and tree trunks'. Barbour (1912) also remarks: 'The two small white eggs of *Ptychozoon* are always found stuck together in pairs, usually against the wood under the bark of trees'.

The period of incubation of the eggs of *Ptychozoon* appears to be variable. According to Bauer (1885) it should be about six months, but Tweedie (1954) gives the actual time between laying and hatching of two eggs by a captive female kept by Mr. H. J. Kitchener as 73 days. The pair photographed by Tweedie hatched out 67 and 68 days after being found, and according to Mr. C. S. Ogilvie, who actually got these eggs, they were fresh at the time of collection. It appears that the egg-laying period in this species is November-December and the period of incubation may vary from about ten weeks to more than five months. Annandale (1904) thinks that the hard shell of the egg is impermeable to fluids. Its habit of attaching the eggs to the bark of trees, leaves, etc., and the long incubation period may account for the presence of this species of gecko in the Andaman and Nicobar group of islands. This is possible because logs of wood, bamboos, etc. from the Burmese and Malayan coasts quite often find their way to the Andaman and Nicobar Islands drifting along with the current.

Ptychozoon is a genus of gecko which, among other features, is characterised by the possession of widely-webbed digits and lateral cutaneous expansions of head, body, and tail (the last is frilled). The function of these expansions was subject to much speculation till recently. Cantor (1847) thought that these membranous expansions act like a 'parachute', helping the animal in



Text-fig. Eggs of *Ptychozoon kuhli* Stejneger

'flying' from one branch to another. Boulenger (1908) confirmed Cantor's views by recording a specimen 'caught by a native in the act of flight'. Annandale (1905), however, disputed the flight theory. He opined that these membranes, which lie curled round the body, help to conceal the animal in its surroundings. Barbour (1912) agreed with Annandale and said: 'As for flying with such weak supports this struck us at once as both being impossible and ridiculous. Individuals were teased into jumping from a table, were dropped from several feet up in the air, and were in every way induced to try to use what has so often been called their parachute. They never did this once.' Smith (1935) rejected Annandale's contention and believed in Cantor's view, suggesting that the extensions are raised by wind resistance, thereby acting as sort of 'parachutes' and thus aiding the lizard in gliding.

Recently Tweedie (1950, 1954) performed certain experiments on *Ptychozoon kuhli* to test the flight theory. He reports that these cutaneous flaps lie curled round the body when the animal is

at rest or crawling, and are only accidentally expanded. They do have a procryptic value, and help the animal in making it less conspicuous against the background when expanded, but they are not an adaptation to that end. On the other hand, when launched into the air from a height the animal, after a drop varying from 2½ to 5 ft. (.75 to 1.50 m.), invariably glides, always in the direction of the wind, making an angle of 52°-53° from the vertical. While gliding the lateral cutaneous expansions are widely spread, the limbs and tails are stiffly outstretched, landing on the ground like a true Flying Lizard (*Draco*). On the basis of his experiments Tweedie (1950) concludes that the dorsal pattern of coloration, in lighter and darker shades of brown, 'is very effective as an aid to self effacement on a background of bark', and the frilled tail and webbed feet enhance the procryptic effect. The lateral expansions on the head and body are adaptations for gliding alone, and in this again they are helped by the widely webbed digits and frilled tail, all of which, by offering resistance to wind, aid in the process.

As far as the procryptic nature of the dorsal pattern, the webbed feet, and frilled tail are concerned, my observations are entirely in conformity with those of Tweedie. Against a background of bark, the animal almost totally disappears and is very difficult to make out. However, I did not see any gliding by this gecko, which does not seem to be uncommon in the Car Nicobar, during my fortnight's stay there. Though Barbour (1912), failing to induce his individuals to glide, rejected the flight theory 'as both being impossible and ridiculous', Tweedie's experiments conclusively prove the gliding capacity of *Ptychozoon kuhli*. In his first experiment Tweedie launched the animal from a height of 20 ft. (6.10 m.), from the ground, while in his subsequent efforts a height of 34 ft. 6 in. (10.50 m.) was used. The descent had two components, an initial drop of 2½ ft. (.75 m.) and 5 ft. (1.50 m.), followed by gliding at an angle of 52°-53° to vertical in the direction of the wind. It is apparent that Barbour failed because he did not launch his specimens from a sufficient height, thus giving no time for the membranous expansions to be raised by wind resistance. As these membranes do not have any muscular supports, they cannot expand and shut voluntarily, and are passive like parachutes. In falling from greater heights, the wind resistance encountered is strong enough to open the membranes, thus enabling the individual to glide obviously along the direction of wind. It would thus appear that an important

factor in the gliding of *Ptychozoon* is the height from which the animal launches itself into the air.

ZOOLOGICAL SURVEY OF INDIA,
CALCUTTA-12, K. K. TIWARI
June 12, 1961.

REFERENCES

Annandale, N. (1904) : Contributions to Oriental Herpetology I.—The Lizards of the Andamans, with the description of a new Gecko and a note on the Reproduced Tail in *Ptychozoon homalocephalum*. *J. Asiat. Soc. Beng.* **73**, Pt. 2 Suppl. : 12-22.

— — — (1905) : Notes on some Oriental Geckoes in the Indian Museum, Calcutta, with Description of New Forms. *Ann. Mag. nat. Hist.* (7) 15 : 26-32.

Barbour, T, (1912) : A contribution to the Zoögeography of the East Indian Islands. *Mem. Harv. Mus. comp. Zool.* **44** : 1-203, pl. i-viii.

Bauer, F. H. (1885) : in Secretary's Report. *Proc. zool. Soc. Lond.* : 718.

Boulenger, G. A. (1908) : Fishes, Batrachians, and Reptiles. *J. Fed. Malay St. Mus.* **3** : 64.

Cantor, T. (1847) : Catalogue of Reptiles inhabiting the Malayan Peninsula and Islands, collected or observed by Theodore Cantor, Esqr., M. D. *J. Asiat. Soc. Beng.* **16** : 607-656.

Smith, M. A. (1935) : Fauna Brit. India., Rept. and Amph. Vol. 2 Sauria, pp. ix + 422. 1 pl.

Tweedie, M. W. F. (1950) : The flying Gecko, *Ptychozoon kuhli* Stejn. *Proc. zool. Soc. Lond.* **120** : 13, pl. i.

— — — (1954) : Notes on Malayan Reptiles. No. 3. *Bull. Raffles Mus.* **25** 107-117, pl. i.

13. THE COMMON CALOTES OR BLOODSUCKER LIZARD [*CALOTES VERSICOLOR* (DAUDIN)] AS A PREDATOR OF BIRDS

During the recent (March 1961) Bombay Natural History Society/ World Health Organization Bird Migration work at Wanoti (Bhuj, Kutch) I twice had occasion to rescue from a Common Calotes or Bloodsucker Lizard [*Calotes versicolor* (Daudin)] birds caught in one of our nets stretched out near a pond. In the first instance it was a Bluethroat (*Erithacus svecicus*). Little damage was done as I was present when the lizard ran along the ground and seized the bird which was caught low down in the net.

A few days later I heard cries of distress from the same net and saw that a *Calotes* had caught a Baya (*Ploceus philippinus*) in similar conditions. The bird was bitten on the forehead and the wing but flew away when released. The lizard, probably the same individual, was secured and found to be a male measuring 16 inches (405 mm.).